IN THE CLAIMS

Please amend the claims as follows. All pending claims after this amendment are listed below for the convenience of the Examiner. Claims amended by the Amendment are indicated as such. Claims new in the Amendment are indicated as such.

1. (Amended) An input device for providing a signal to effect one of translational movement, rotational movement, and both translational and rotational movements of an object on a graphical display, comprising:

a device for capturing video images;

an input image processor that translates captured video images of human arm motion into signals that are delivered to an output image processor, the input image processor programmed to (a) isolate a human form from a background in a captured video image by comparing the captured video image with a video image of the background without the human form; (b) determine a position and a movement of arms of the human form; and (c) generate an output signal responsive to one of the position, the movement, and both the position and the movement of the human arms; and

an output image processor that is programmed to effect one of translational movement, rotational movement, and both translational and rotational movement of an object on a graphical display in response to the signals received from the input image processor.

2. (Amended) The input device of claim 1 wherein the output image processor changes the graphical display according to a perspective of what a flying object would see.

3. The input device of claim 1 wherein the output image processor generates a graphical display of a flying object whose position and motion are responsive to the signal output by the input image processor.

4. (Amended) A method for generating signals to effect one of translational movement, rotational movement, and both translational and rotational movements of an object on a graphical display using human arm position and movement data, comprising:

providing an image processor and a device for capturing video images;

capturing video images of a background without a human form and a background with a human form;

processing the captured video images to isolate the human form from the background;

isolating arm portions of the human form;

calculating arm position and movement data; and

generating a signal responsive to the arm position and movement data for effecting one of translational movement, rotational movement, and both translational and rotational movements of an object on a graphical display.

5. (Amended) A method for generating signals using one of human arm position data, human arm movement data, and both human arm position and movement data, comprising:

providing an image processor and a device for capturing video images;

capturing video images of a background without a human form and a background with a human form with the device;

using the image processor to process the captured video images to isolate the human form from the background;

isolating arm portions of the human form from a captured video image using the image processor;

calculating arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor.

6. (Amended) A method for generating signals to effect one of translational movement, rotational movement, and both translational and rotational movements of an object on a graphical display using one of human arm position data, human arm movement data, and both human arm position and movement data, comprising:

providing an image processor and a device for capturing a video sequence;

capturing, from the video sequence, a frame that does not include a person;

isolating a view comprising a foreground subject image view by performing an algorithm on the video sequence and the frame that does not include the person;

determining whether the isolated view includes an image of a person;

determining a horizontal extent of a torso in the image of the person so as to isolate arm portions of the person in frames of the captured video sequence;

computing arm angles by calculating angles of principle moment of nonzero pixels in the arm portions of the image of the person; and

generating an arm position data signal responsive to arm angles for effecting one of translational movement, rotational movement, and both translational and rotational movement of an object on a graphical display.

7. (Amended) The method of claim 6 wherein the step of determining whether the isolated view includes the image of the person comprises the steps of:

counting a total number of nonzero pixels in the foreground image;

ensuring that the total number of nonzero pixels in the foreground image falls within a range defined by a minimum and a maximum threshold number of pixels.

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8. (Amended) The method of claim 6 wherein the algorithm in the isolating step involves subtracting the frame that does not include the person from individual frames in the video sequence.

9. The method of claim 6 wherein the following algorithm is used in the isolating step:

(a) obtain static background Y0 U0 V0 frames;

(b) smooth images Y0 U0 V0 using a 5x5 Gaussian convolution;

(c) obtain current Y U V video frames;

(d) smooth images Y U V using a 5x5 Gaussian convolution;

(e) for each pixel in Y, compute Ydif = abs(Y – Y0);

(f) for each pixel in U, compute Udif = abs(U – U0);

(g) for each pixel in V, compute Vdif = abs(V – V0);

(h) for each pixel in Ydif Udif Vdif, compute Sum = Ydif + Udif*8 + Vdif*8;

(i) for each pixel in Sum, compute Foreground = 1 if Sum > Threshold, 0 otherwise;

(j) erode Foreground using standard erosion morphological filter (to remove any single-pixel erroneous measurements, such as caused by salt-and-pepper noise).

10. (Amended) The method of claim 6 wherein the arm position data signal generated in the generating step is selected from the group consisting of signals related to object airspeed acceleration, bank angle, and pitch angle.

11. (Amended) The method of claims 6 wherein the arm position data signal generated in the generating step is determined with the inclusion of smoothing constants.

12. (Amended) A method for generating signals for use in a flight simulator graphical display using human arm position data to effect one of translational movement, rotational movement, and both translational and rotational movement, comprising:

providing a device for capturing video images and an image processor;

capturing video images with the device, the video images including an image of a background without a human form and an image of a background with a human form;

using the image processor to process the captured video images to isolate the human form from the background;

isolating arm portions of the human form from a captured video image using the image processor;

calculating arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor for use in generating a state of a flight simulator graphical display.

13. The method of claim 12 wherein the flight simulator graphical display includes as an object a flying creature that moves wings.

14. The method of claim 12 wherein the flight simulator graphical display depicts a change in perspective of what a flying creature would see.

15. (Amended) The method of claim 13 further including a step of generating flapping noises corresponding to movement of the wings of the flying creature.

16. (Amended) The method of claim 15 wherein a volume of the flapping noises increases with an increased rate of arm motion.

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17. (Amended) The method of claims 15 wherein the flapping noises are triggered when a signed time rate of change of an average of arm angles exceeds a pre-determined threshold.

18. (Amended) An article of manufacture embodying a program of instructions executable by a machine, the program of instructions including instructions for:

capturing video images;

processing the captured video images to isolate a human form from a background;

isolating arm portions of the human form;

calculating arm position and movement data, wherein the calculating includes calculating angles of principle moment of the arm portions of the human form; and

generating a signal responsive to the arm position and movement data for effecting one of translational movement, rotational movement, and both translational and rotational movement of an object on a graphical display.

19. (Amended) The article of manufacture of claim 18 wherein the signal generated by the program of instructions is used to generate a state of a flight simulator graphical display.

20. (Amended) An article of manufacture embodying a program of instructions executable by a machine, the program of instructions including instructions for:

capturing video images with a device, the video images including an image of a background without a human form and an image of a background with a human form;

using an image processor to process the captured video images to isolate the human form from the background;

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isolating arm portions of the human form from a captured video image using the image processor;

calculating arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor.

21. (Amended) An article of manufacture embodying a program of instructions executable by a machine, the program of instructions including instructions for:

capturing, from a video sequence, a frame that does not include a person;

isolating a view of an image of the person by performing an algorithm on the video sequence and the frame that does not include the person;

determining whether the isolated view includes the image of the person;

determining a horizontal extent of a torso of the person in the image so as to isolate arm portions of the person in the image;

computing arm angles by calculating angles of principle moment of nonzero pixels in the arm portions of the person in the image; and

generating one of an arm position data signal, an arm movement data signal, and both arm position and movement data signals responsive to the computed arm angles for effecting one of translational movement, rotational movement, and both translational and rotational movement of an object on a graphical display.

22. (New) A method for generating signals for use in a flight simulator graphical display using human arm position data to effect one of translational movement, rotational movement, and both translational and rotational movement, wherein the flight simulator graphical display includes as an object a flying creature that moves wings, comprising:

providing a device for capturing video images and an image processor;

capturing video images with the device;

using the image processor to process the captured video images to isolate a human form from a background;

isolating arm portions of the human form from a captured video image using the image processor;

calculating arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor, the signal to be used in generating a state of the flight simulator graphical display.

23. (New) The method of claim 22 further including a step of generating flapping noises corresponding to a movement of the wings of the flying creature.

24. (New) The method of claim 23 wherein a volume of the flapping noises increases with an increased rate of arm motion.

25. (New) The method of claim 23 wherein the flapping noises are triggered when a signed time rate of change of an average of calculated arm angles exceeds a pre-determined threshold.

26. (New) A method for generating signals for use in a flight simulator graphical display using human arm position data to effect one of translational movement, rotational movement, and both translational and rotational movement, comprising:

providing a device for capturing video images and an image processor;

capturing video images with the device;

using the image processor to process the captured video images to isolate a human form from a background;

isolating arm portions of the human form from a captured video image using the image processor;

calculating arm position and movement data using the image processor; and

generating a signal responsive to the arm position and movement data using the image processor, the signal to be used in generating a state of the flight simulator graphical display, wherein the flight simulator graphical display depicts a change in perspective of what a flying creature would see.